XR Online Platform

Towards More Realistic Online Meetings

Nov 18

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大阪大学
OSAKA UNIVERSITY

FORUM 8

world16

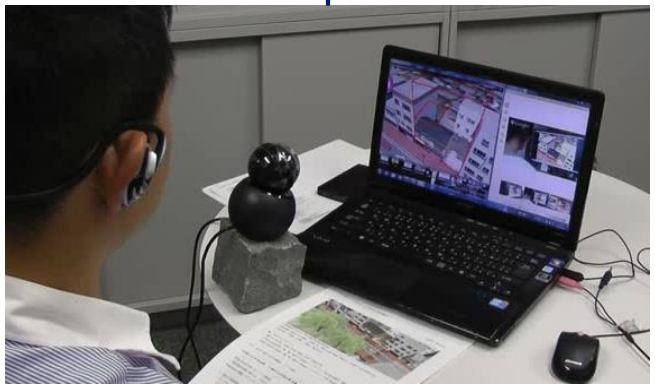
Future Meeting Style? Venice Biennale 2006

Remote conferencing while sharing 3D virtual space

2010-2012
[different places & same time]

Lei Sun, Tomohiro Fukuda, Bernd Resch
A synchronous distributed cloud-based virtual reality meeting system for architectural and urban design
Frontiers of Architectural Research, 3(4), 2014, pp. 348-357

Architect at Chiba, Japan



Engineer at Osaka, Japan

Participant at Heidelberg, Germany

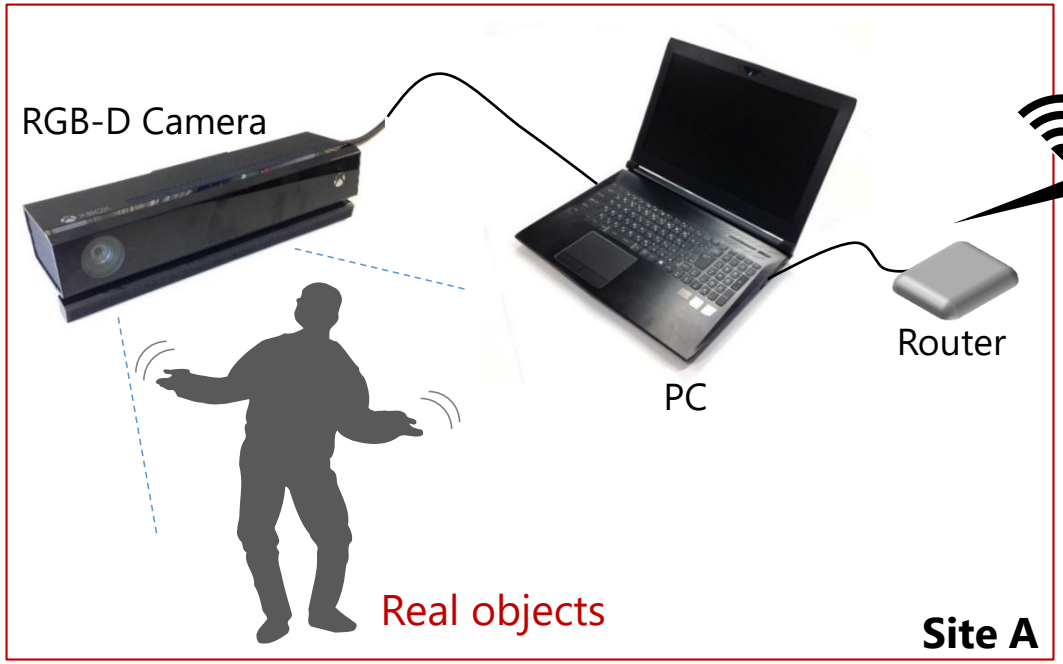
Towards a variety of online social and economic activities

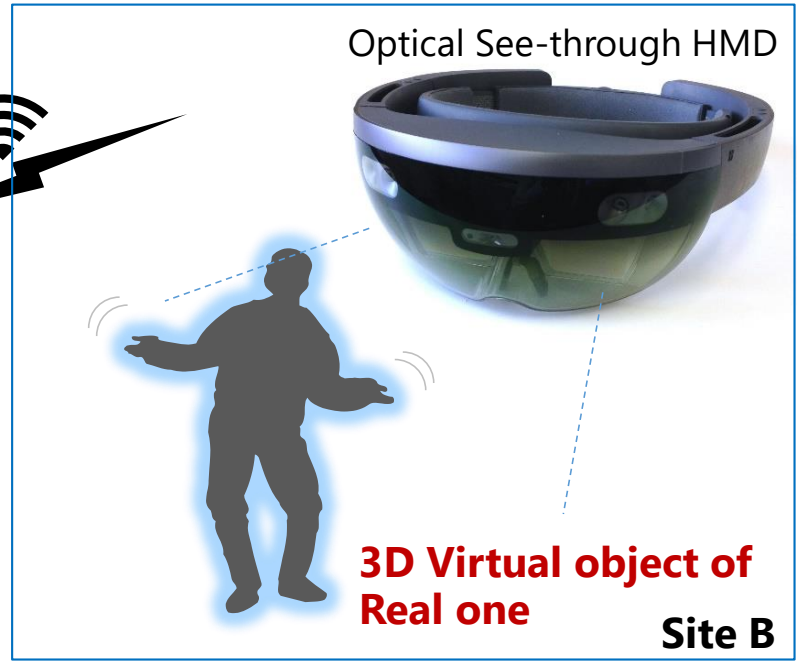
- **Adapting to new lifestyles**
  - remote
  - non-face-to-face
  - contactless
- **Improving quality of online service**
  - high capacity
  - low latency
  - multiple simultaneous connections
- **XR online communication platforms for F8VPS:**
  - Investigating features in existing platform
  - Development of a real-time remote sharing system for real objects

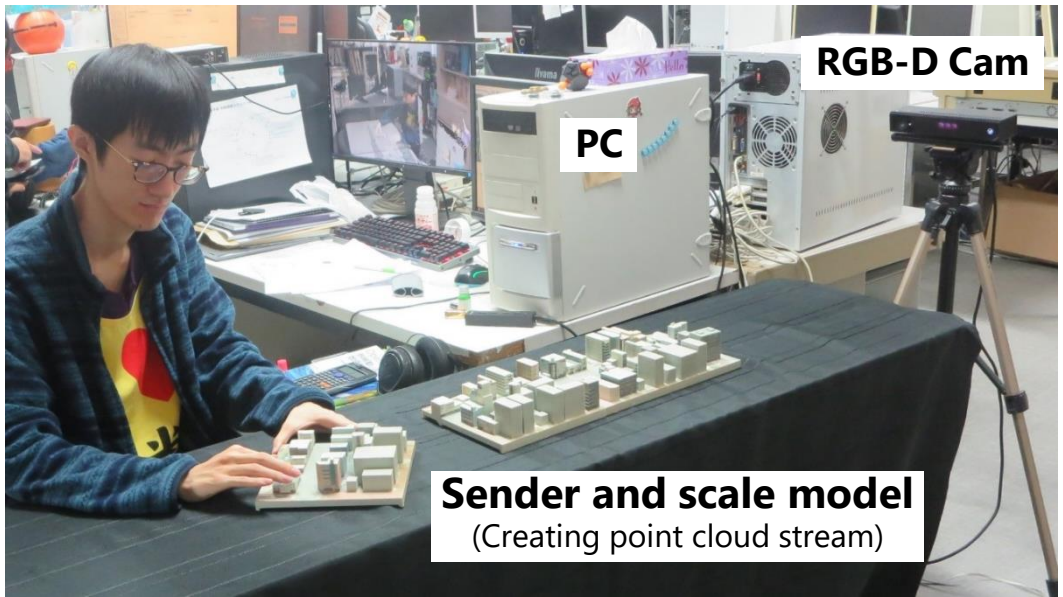
Development of a Mixed Reality System for Real-Time Remote Sharing of 3D Real Objects

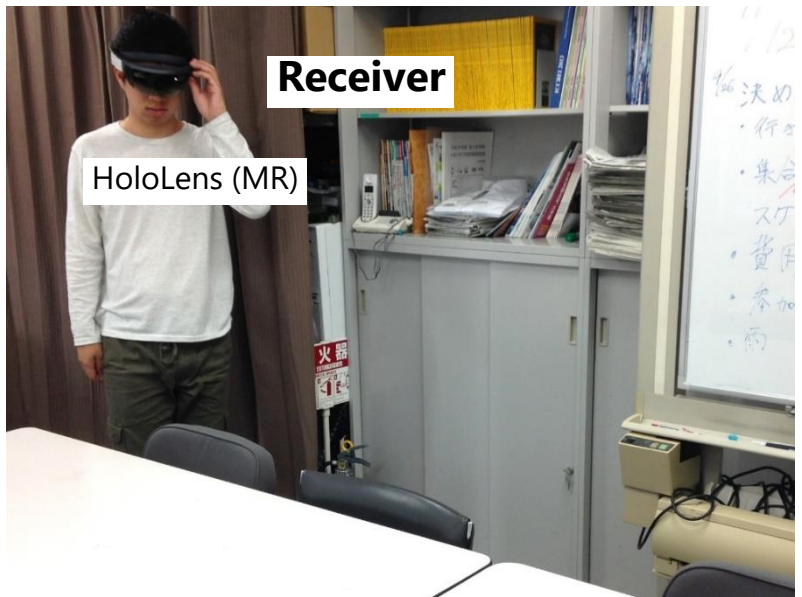
3D Remote Sharing of the Real Objects

Using real-time point cloud on mixed reality









Tomohiro Fukuda, Yuehan Zhu, Nobuyoshi Yabuki

Point Cloud Stream on Spatial Mixed Reality: Toward Telepresence in Architectural Field

36th eCAADe Conference, 2018, 727-734

View from MR user

Speed: x1.5 | BGM: MusMus

Interactive Remote Collaboration Method for 3D Physical Objects Using Real-time Point Cloud Segmentation and Mixed Reality

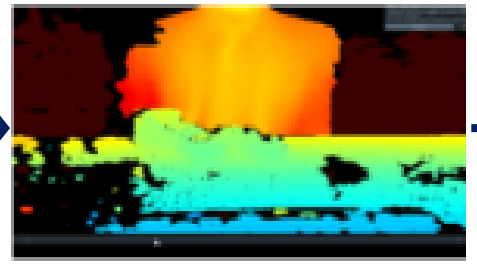
1. Collision detection with the viewpoint cursor by meshing the real space using SLAM
2. The receiver can dynamically observe the assembly of the building block model by the sender.
3. The receiver can assemble the virtual building block model and place it on the real plane.

Daichi Ishikawa, Tomohiro Fukuda, Nobuyoshi Yabuki

A mixed reality coordinate system for multiple HMD users manipulating real-time point cloud objects

38th eCAADe Conference, 2020, 197-206

A Remote Sharing Method of 3D Real Objects with Instance-segmented 3D Point Cloud Acquired in Real-time



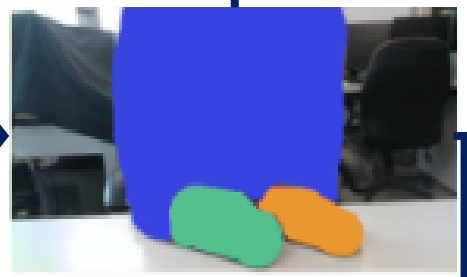
Depth Image

3D Real Objects

Create a point cloud by merging segmentation & depth images

XYZ Data

RGB Image

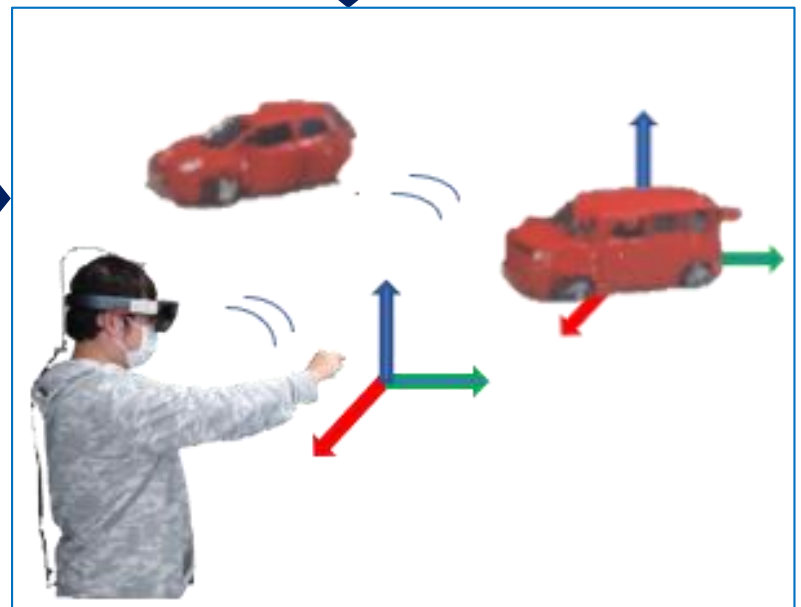


Instance Segmentation Image

Segmentation Data

RGB Data

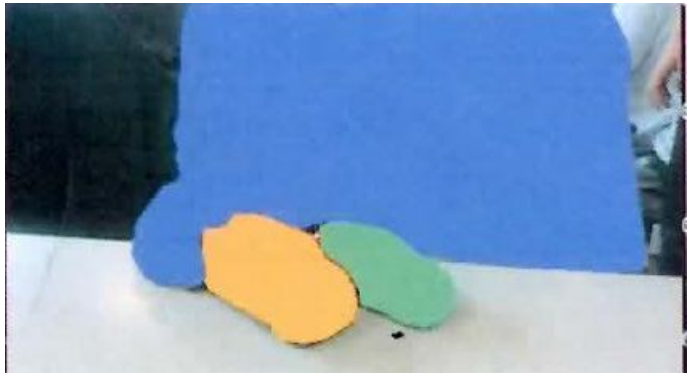
Site A



Site B

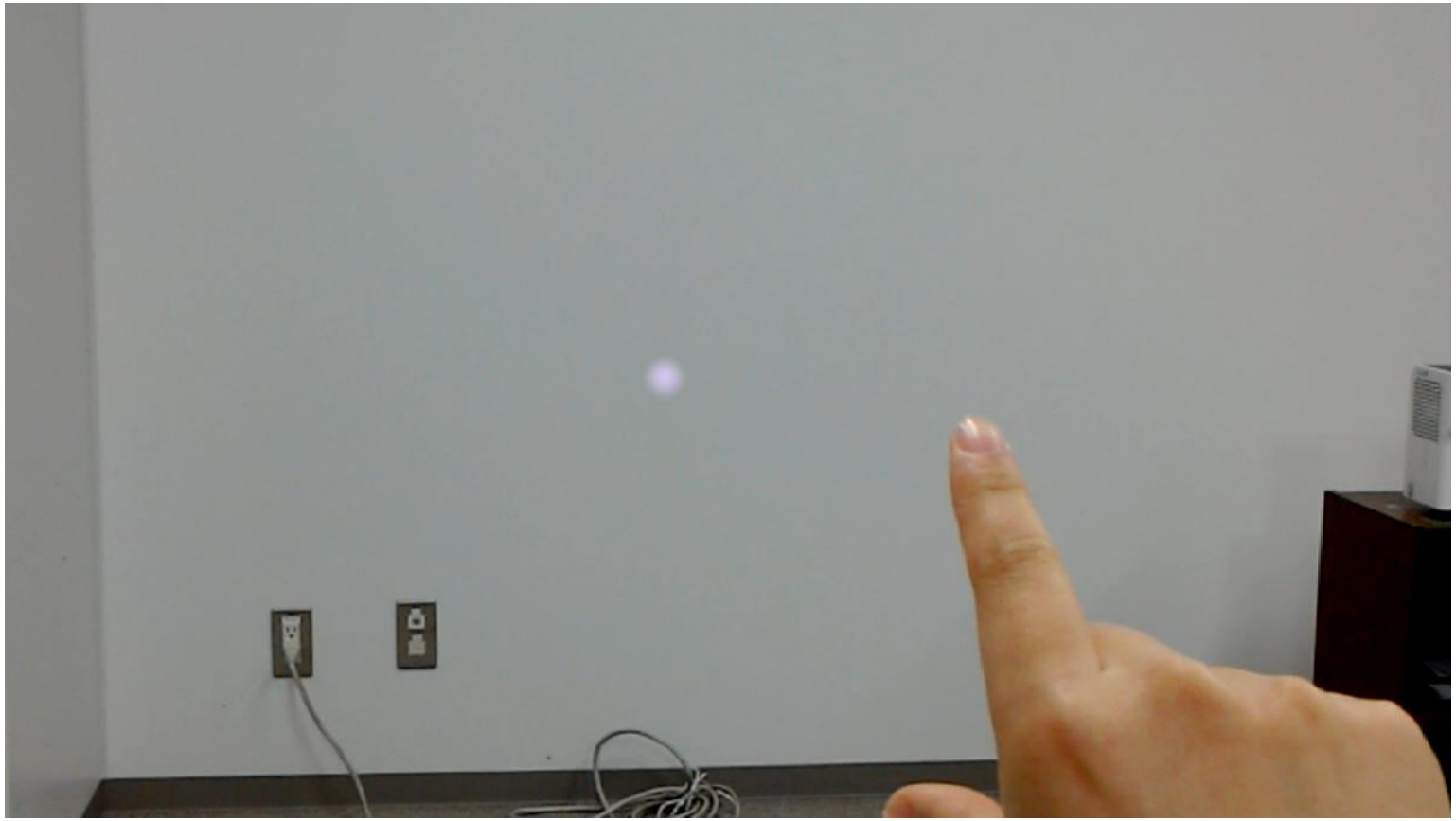
A Remote Sharing Method of 3D Real Objects with Instance-segmented 3D Point Cloud Acquired in Real-time

RGB Image



Instance Segmentation Image

Site A



Site B

VR Online Platform

Towards More Realistic Online Meetings

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12th VR Summer Workshop

7/5-7/8 2021